IN THE DRAWINGS

New FIG. 4 is shown in the enclosed new drawing sheet.

REMARKS

Claims 1-19 are pending in the application and all of the claims have been rejected. Claims 3-4, 13, 15 and 18 have been amended and Applicants have canceled claims 12 and 17 without prejudice. Applicants respectfully traverse the rejection and seek favorable reconsideration in view of the following remarks.

The Examiner objected to the drawings under 37 CFR 1.83(a). Rule 1.83 provides that "[t]he drawings must show every feature of the invention specified in the claims." The Examiner asserts that "the means for reciprocally moving that is arranged to rotate the shaft (claim 10) must be shown or the feature(s) canceled from the claim(s)." The Examiner states that "[t]here is no structure shown in the drawings or disclosed in the specification that provides the function of rotating the shaft while reciprocating." The Examiner requires "[c]orrected drawing sheets in compliance with 37 CFR 1.121 (d)...in reply to the Office action to avoid abandonment of the application."

Applicants enclose a New Sheet in compliance with Rule 1.121 which sets forth a FIG. 4. The specification has been amended to reference FIG. 4. FIG. 4 shows a cross-section of a pneumatic cylinder with a rotating shaft. Support for FIG. 4 is found in original claim 10 and paragraph [0011] of the application as filed. No new matter has been introduced. Accordingly, Applicants respectfully request withdrawal of the objection to the drawings.

Claims 3, 4 and 18 were objected to under 37 CFR 1.75(c), "as being of improper dependent form for failing to further limit the subject matter of a previous claim." The Examiner asserts that "[b]oth of claims 3 and 18 only disclose a function, which appears to be a method step for using the apparatus being claimed." The Examiner concludes that claims 3 and 18 "do not provide any further **structure** to the apparatus." Moreover, the Examiner suggests canceling claims 3 and 18 "because claims 5 and 19 both effectively claim structure that will provide the same function as the applicant attempts to claim in claims 3 and 18, respectively."

Applicants have amended dependent claim 3 to claim "The ~~apparatus~~ method according to claim ~~1~~ 16 wherein the step of injecting heated, compressed gas into the body comprises injecting the gas ~~is injected~~ at a temperature within the range from 50 to 200°C." Applicants have also amended dependent claim 18 to claim "The ~~apparatus~~ method according to claim ~~1~~ 16 wherein the step of injecting heated, compressed gas into the body comprises injecting the gas ~~is~~

~~injected~~ at a temperature within the range from 80 to 150°C." Applicants respectfully submit that amended dependent claims 3 and 18 are in proper dependent form under 37 CFR 1.75(c) because they further limit the subject matter of independent method claim 16. Accordingly, Applicants respectfully request withdrawal of the objection to dependent claims 3 and 18.

Similarly, the Examiner asserts that "claim 4 also fails to further limit the **structure** of the apparatus because the claim only discloses a gas that is intended to be used with the apparatus, but does not provide any further limitations regarding the actual structure of the apparatus." Applicants have amended dependent claim 4 to claim "The ~~apparatus~~ method according to claim ~~1~~ 16 wherein the step of injecting heated, compressed gas into the body comprises injecting heated, compressed dry air or nitrogen." Applicants respectfully submit that amended dependent claim 4 is in proper dependent form under 37 CFR 1.75(c) because it further limits the subject matter of independent method claim 16. Accordingly, Applicants respectfully request withdrawal of the objection to dependent claim 4.

The Examiner objected to claims 13 and 14 because "as best understood by the Examiner, the 'means for preventing particulates from being drawn in to the means for moving' in claim 12 is the same as the 'means for scraping particulates from the shaft' in claim 13, which is the annular seal disclosed in claim 14." The Examiner concludes that "it appears as though the applicant is attempting to claim the same part with two different names/descriptions, which confuses the scope of the claim." The Examiner suggests removing "reference to either the 'means for preventing particulates from being drawn in to the means for moving' or the 'means for scraping particulates from the shaft' from either claim 12 or 13 and indicate in claim 14 that the annular seal is one or the other."

Applicants have canceled claim 12 and amended claim 13 to depend from independent claim 1. Applicants respectfully submit that the scope of dependent claims 13 and 14 is clear and respectfully request withdrawal of the objection to these claims.

The Examiner rejected claim 10 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Section 112, first paragraph, provides that "[t]he specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his

invention." The Examiner has "the initial burden to establish a reasonable basis to question the enablement provided for the claimed invention." M.P.E.P. § 2164.04 (Rev. 6, Sept. 2007) (citing *In re Wright*, 999 F.2d 1557, 1562, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993)). "The test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation." *U.S. v. Telectronics, Inc.*, 857 F.2d 778, 785, 8 USPQ2d 1217, 1223 (Fed. Cir. 1988); *See* M.P.E.P. § 2164.01. "Doubt may arise about enablement because information is missing about...essential parts...which one skilled in the art could not develop without undue experimentation." M.P.E.P. § 2464.04. However, under such circumstances, "the Examiner should specifically identify what information is missing and why one skilled in the art could not supply the information without undue experimentation." *Id.* (citing M.P.E.P. § 2164.06(a)).

The Examiner asserts that "[t]he claim(s) contains subject matter which was not described in the specification...[so] as to enable one skilled in the art...to make and/or use the invention." More particularly, the Examiner states that "the specification fails to discuss any structure for the 'means for reciprocally moving' that provides the function of rotating the shaft to rotate the scraper." The Examiner concludes that "the applicant fails to provide sufficient disclosure to allow one of ordinary skill in the art to make or use the invention as claimed in claim 10." Applicants respectfully disagree with the Examiner's assertions and seek favorable reconsideration in view of the following remarks.

Dependent claim 10, as filed, claims that the "means for reciprocally moving is arranged to rotate the shaft so as to rotate the scraper within the pipe." Independent claim 1, from which claim 10 depends, claims "a scraper attached to one end of the shaft, [and] means for reciprocally moving the shaft..." Contrary to the Examiner's assertion that the specification *fails* to disclose *any* structure for the "means for reciprocally moving...arranged to rotate the shaft," the specification *does* disclose such structure as set forth in paragraph [0011] of the application as published. Indeed, the specification discloses that "the moving means comprises a piston attached to the other end of the shaft, the piston being reciprocally moveable within a cylinder." ¶ [0011]. The specification further discloses that "[a] variety of pneumatic cylinders are commercially available (for example, single or double acting...with fixed or *rotating shaft*)." ¶ [0011] (emphasis added). The specification also discloses that "[a] preferred embodiment uses a double acting pneumatic cylinder with a *rotating shaft*..." ¶ [0011] (emphasis added). In

addition, Applicants submit in the enclosed Information Disclosure Statement, two product data sheets: 1) SMC "Rotary Clamp Cylinder" for the MK and MK2 series (created on October 14, 2002); and 2) E&E Special Products "Mini-Powered Rota-Shafts/1.12" Bore" (created on September 15, 2000). Accordingly, Applicants respectfully submit that one reasonably skilled in the art could make or use the invention as claimed in dependent claim 10, from the disclosures in paragraph [0011] of the specification coupled with information known in the art without undue experimentation. Thus, dependent claim 10 is enabled and Applicants respectfully request withdrawal of the rejection to dependent claim 10.

In addition, Applicants respectfully submit that the Examiner has failed to carry the burden of explaining "why one skilled in the art could not supply the information[, i.e. the "structure,"] without undue experimentation." M.P.E.P. § 2464.04 (citing M.P.E.P. § 2164.06(a)). If an element of an invention is commercially available, then how can it be reasonably concluded that one would have to endeavor in undue experimentation in order to make or use that aspect of the invention? Applicants respectfully submit that in light of the disclosure in paragraph [0011] of the specification as filed and the enclosed IDS, the Examiner has failed to carry the burden of establishing a "reasonable basis to question the enablement" for dependent claim 10. Accordingly, in view of the foregoing remarks, Applicants respectfully submit that dependent claim 10 is enabled by at least the specification as filed and request withdrawal of the rejection under § 112, first paragraph.

Claim 10 was also rejected under 35 U.S.C. § 112, second paragraph, "as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention." Section 112, second paragraph, provides that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." "The test for definiteness...is whether 'those skilled in the art would understand what is claimed when the claim is read in light of the specification.'" M.P.E.P. § 2173.02 (citing *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986). Definiteness must be analyzed in view of: "(A) The...application disclosure; (B) The teachings of the prior art; and (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made." Notably, "[t]he meaning of every term used in a claim

should be apparent from the prior art or from the specification and drawings at the time the application is filed." M.P.E.P. § 2173.05(a)(I).

The Examiner asserts that "it is unclear how the applicant provides the 'means for reciprocally moving' with the function of rotating the shaft." Applicant respectfully traverses the rejection and seeks favorable reconsideration in view of the following remarks.

As discussed above with respect to the rejection of dependent claim 10 under § 112, first paragraph, the specification discloses that "the moving means comprises a piston attached to the other end of the shaft, the piston being reciprocally moveable within a cylinder." ¶ [0011]. Thus, the "means for reciprocally moving" is apparent from at least the specification as filed. The specification further discloses that "[a] variety of pneumatic cylinders are commercially available (for example, single or double acting...with fixed or *rotating shaft*)." ¶ [0011] (emphasis added). Paragraph [0011] further discloses that "[a] preferred embodiment uses a double acting pneumatic cylinder with a *rotating shaft*..." (emphasis added). Accordingly, a "'means for reciprocally moving' with the function of rotating the shaft" is also apparent from the specification as filed. Applicants respectfully submit that dependent claim 10, which claims "the means for reciprocally moving is arranged to rotate the shaft..." is understandable when read in light of at least the specification as filed. Thus, Applicants respectfully submit that dependent claim 10 is clear and definite as required under § 112, second paragraph. Accordingly, Applicants respectfully request withdrawal of the rejection to dependent claim 10 as being indefinite under § 112, second paragraph.

The Examiner advised "that should claims 1 and/or 16 be found allowable, claims 15 and/or 17, respectively, will be objected to under 37 CFR 1.75 as being...substantial duplicates thereof." The Examiner cited M.P.E.P. § 706.03(k) to explain that "[w]hen two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim." The Examiner also set forth the basis of a statutory double patenting rejection under 35 U.S.C. § 101. The Examiner asserts that "[c]laim 15 is a substantial duplicate of claim [1], the only difference being the intended use for an inlet pipe, but all of the claimed structure being substantially identical to claim 1." In addition, the Examiner asserts that "claim 17 is considered to be a substantial duplicate of claim 16, again the

method only varying in that the apparatus is provided to an inlet pipe, but all of the claimed method steps and corresponding structure otherwise being identical to claim 16."

Applicants have amended independent claim 15 to claim "a double acting pneumatic cylinder ~~means for~~ adapted to reciprocally ~~moving~~move and rotate the shaft..." Support for the amendment to independent claim 15 is found in paragraph [0011] of the specification as filed. No new matter has been introduced. Applicants respectfully submit that independent claim 1 and amended independent claim 15 are not substantial duplicates because they claim different structure. Applicants have canceled independent claim 17. Thus, Applicants respectfully submit that an objection to claims 1 and 15-16 under 35 CFR § 1.75 would be improper.

Claims 1-2, 4, 6-11 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,263,535 ("Wang") in view of U.S. Patent No. 5,935,283 ("Sweeney") and Great Britain Patent No. 2 342 372 A ("Head"). Section 103(a) provides that "A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains..." The Supreme Court in *KSR* held that "[t]here is no necessary inconsistency between the idea underlying the TSM [teaching, suggestion, motivation] test and the *Graham* analysis." M.P.E.P. §2141 (rev. 6, Sept. 2007), citing *KSR*, 127 S. Ct. at 1741, 82 U.S.P.Q. 2d at 1396. Thus, when applicable, as here, TSM reasoning may still be applied, not only by an examiner, but also by Applicant to refute a § 103 obviousness rejection.

The Examiner asserts that "Wang discloses an apparatus for reducing clogging of pipes...comprising a body (20) having an open end (200) adapted to be detachably connected to an aperture of a pipe, a shaft (22) movable within the body, a scraper (21) attached to one end of the shaft, [and] a mechanism for reciprocally moving the shaft to urge the scraper into the pipe to dislodge particles deposited within the pipe and to withdraw the scraper from the pipe." The Examiner concedes that "the mechanism for reciprocally moving the shaft disclosed by Wang is different than the structure disclosed by the applicant that is supported by the 'means for reciprocally moving', assuming that 35 U.S.C. 112, sixth paragraph is invoked." However, the Examiner asserts that "Head discloses a similar apparatus for reducing clogging in a pipe that comprises a scraper and a mechanism to reciprocally move the scraper into or out of the pipe

and...the mechanism may be a piston to enable the scraper to be hydraulically or pneumatically driv[en] inside the tube." The Examiner concludes that "Head discloses that a known equivalent in the art to reciprocally move the scraper within the pipe is a hydraulic or pneumatic piston, which will provide the same function as the moving mechanism disclosed by Wang." The Examiner further concludes that "it would have been obvious...that the moving mechanism of Wang may be replaced by a hydraulic or pneumatic piston, being known equivalents in the art, as taught by Head, which is equivalent to the applicant's 'means for reciprocally moving'." Applicants respectfully traverse the rejection and seek favorable reconsideration in view of the following remarks.

Wang teaches an invention that "relates to a cleaning apparatus used to clean caking adhered on the inner wall of a pipe." Col. 1, Ln. 7-8. Wang further teaches that in "fab", waste gases mixed with particles and toxic gases are exhausted from etching and deposition chambers through pipes and into a waste gas treatment device. Col. 1, Ln. 9-14. In addition, Wang teaches mounting its cleaning apparatus 2 to "a waste gas treatment device 10 of a semiconductor fab." Col. 1, Ln. 66-67; Col. 2, Ln. 1-13; FIGS 1-2. In contrast to Wang, Head teaches an "apparatus for scraping the inner bore of pipework, for example a well casing" where "matter from...oil has become encrusted upon the inner surface of the conduit." p. 1, Ln. 3-10. Head further teaches that "[t]hese deposits may be of very viscous oil, or of other mineral matter carried up with the oil..." p. 1, Ln. 10-12. In addition, Head teaches that "[s]ome deposits may be of a very tough nature and have adhered themselves firmly to the well casing wall." p. 5, Ln. 1-2. Thus, the nature of the deposits taught by Wang and Head, and consequently the devices taught by Wang and Head to remove such deposits, are significantly different. Indeed, the caking taught by Wang "can be cleanly scrubbed away by the...[scrubber]" (Abstract), whereas the "very viscous" deposits taught by Head may remain even after scrubbing (p. 5, Ln. 1-17). Applicants respectfully submit that there is no teaching, suggestion or motivation to combine the teachings of Wang and Head as set forth by the Examiner. That is, there is no motivation to modify the apparatus of Wang by substituting the "driving device" with a hydraulic or pneumatic piston means as taught by Head because such substitution would be overkill. In addition, there is no teaching or suggestion in Wang to modify its apparatus to include a pneumatic piston as suggested by the Examiner. Accordingly, Applicants respectfully submit that Wang is not combinable with Head.

In addition, assuming *arguendo*, even if Wang were combined with Head the combination would not achieve the invention as claimed. Neither Wang nor Head teach or even suggest "injecting means extending about the body for injecting heated compressed gas into the body to inhibit particulate deposition" as claimed in independent claims 1 and 15. Indeed, the teachings of Wang and Head take for granted that deposits will inexorably form on the inner surfaces of the pipe. Wang teaches a scrubbing device for removing a *cake* (Abstract) and Head teaches a cleaning apparatus for removing *deposits* some of which may be "very viscous" and "may be of a very tough nature...hav[ing] adhered themselves firmly to the...wall" (p. 1, Ln. 10; p. 5, Ln. 1-2). There is no teaching, suggestion (or motivation) in Wang (or Head) to modify the apparatus to include an injecting means to inhibit particulate deposition.

The Examiner concedes that "Wang fails to disclose an injecting means extending about the body for injecting heated gas into the body to inhibit particulate deposition." However, the Examiner asserts that "Sweeney discloses another apparatus for reducing clogging in pipes that transmit gases in fabricating processes and Sweeney teaches that it is desirable [to] provide injecting means to inject heated, compressed gas into the pipes to prevent the gasses from condensing or sublimating and leaving deposits on the walls of the pipes." The Examiner concludes that "it further would have been obvious...to provide the apparatus of Wang with a similar injecting means (considered to be equivalent structure to the applicant's disclosed "injecting means"), as taught by Sweeney, to inject heated, compressed gas into the pipes during cleaning with the scraper to prevent the existing gasses from adding to deposits on the pipe walls and to prevent the deposits being removed by the scraper from re-adhering to the walls." Applicants respectfully traverse the rejection and seek favorable reconsideration in view of the following remarks.

As discussed above, Wang teaches a "cleaning apparatus used to clean caking adhered on the inner wall of a pipe." Col. 1, Ln. 5-9. The "caking can be easily scrubbed off the inner wall of the pipe 11..." Col. 2, Ln. 45-46. In contrast, Sweeney teaches "a clogging-resistant...structure for introducing a...solids-containing and/or solids-forming gas stream to a gas processing system." Col. 1, Ln. 16-18. Sweeney further teaches that "clogging is prone to occur...[and] inlet clogging problems may require...incorporation of plunger mechanisms or other solids removal means to keep the inlet free of solids accumulations." Col. 1, Ln. 48-62. However, Sweeney teaches, "these mechanical fixes add considerable expense and labor to the

system and may damage the entry over time." Col. 1, Ln. 62-64. Sweeney identifies a further problem with the "mechanical fixes" in that "the inlet clogging problems may be systemic and require periodic preventative maintenance to keep the inlet free of solids accumulations." Col. 1, Ln. 64-67. Sweeney's apparatus was apparently designed to overcome the shortcomings of these mechanical fixes. Thus, Sweeney teaches away from a mechanical fix, such as the scrubber of Wang, to prevent clogging of the gas flow passage 66. Indeed, the device and method of Sweeny uses a "steady flow of gas through...[a] gas-permeable wall...[to] maintain[] the particulates in the gas stream flowing through the interior wall surfaces of the inlet structure" and does *not* incorporate a mechanical fix such as a scrubber. Col. 8, Ln. 61-65. Applicants respectfully submit that Sweeney teaches away from the apparatus of Wang and there is no teaching, suggestion or motivation to combine Sweeney with Wang as set forth by the Examiner.

In addition, assuming *arguendo*, even if Wang could be combined with Sweeney, the combination would not achieve the invention as claimed in independent claims 1 and 15. Sweeney teaches a gas-permeable inner porous wall 6 and a gas source 4. Col. 8, Ln. 39-57; FIG. 1. The gas flows from the gas source 4 and through a single gas inlet port 22 in the outer wall 9. *See* FIG. 1. Nowhere does Sweeney teach or even suggest "injecting means *extending about the body* for injecting heated compressed gas into the body to inhibit particulate deposition" (emphasis added) as claimed in independent claims 1 and 15. Thus, even if Sweeney were combined with Wang and Head, the combination would not achieve the invention as claimed in independent claims 1 and 15. Accordingly, in view of the foregoing remarks, Applicants respectfully submit that independent claims 1 and 15 are not rendered obvious by Wang either alone or in combination with Head and Sweeney and respectfully request withdrawal of the rejections to these claims under § 103.

Claims 2, 4 and 6-11 depend either directly or indirectly from independent claim 1. Thus, claims 2, 4 and 6-11 are not rendered obvious by Wang either alone or in combination with Head and Sweeney for at least the reasons set forth above with respect to independent claim 1. Accordingly, Applicants respectfully request withdrawal of the rejections to claims 2, 4 and 6-11.

In addition, the Examiner rejected dependent claim 2 asserting that "Sweeney further discloses that the injecting means comprises an orifice (74) located on an inner surface of the body (7)." The Examiner concludes hat it "would have been obvious that the body of Wang will

also comprise an orifice in the body when provided with the injecting means of Sweeney." Applicants respectfully traverse the rejection and seek favorable reconsideration in view of the following remarks.

Dependent claim 2 claims that "the injecting means comprises an orifice located on an inner surface of the body." As discussed above with respect to independent claim 1, Sweeney teaches away from a "mechanical fix," such as a scraper, and thus, teaches away from the apparatus of Wang. Applicant respectfully submits that Sweeney is not combinable with Wang. In addition, assuming *arguendo*, even if Sweeney could be combined with Wang, the combination would not achieve the invention as claimed in dependent claim 2. Sweeney simply fails to teach or even suggest "injecting means *extending about the body* for injecting heated compressed gas into the body to inhibit particular deposition" (emphasis added) as claimed in independent claim 1 from which claim 2 depends. In addition, Sweeney teaches a gas stream delivery tube 70 having an exhaust end 74 which exhausts within the flow passage 66. However, Sweeney fails to teach or even suggest that "the injecting means comprises an orifice located *on an inner surface* of the body" as claimed in dependent claim 2. Thus, for these further reasons, dependent claim 2 is not rendered obvious by Wang either alone or in combination with Head and Sweeney.

The Examiner also rejected independent claims 16 and 17 asserting that "Wang, Sweeney and Head, as discussed supra, would obviously include all of the method steps disclosed in claims 16 and 17." Applicants respectfully traverse the rejection and seek favorable reconsideration in view of the following remarks.

Applicants have canceled independent claim 17 and thus, the rejection of this claim has been obviated. Applicants respectfully submit that independent claim 16 is similarly not rendered obvious by Wang either alone or in combination with Head or Sweeney for at least the reasons set forth above with respect to independent claims 1 and 15. Accordingly, Applicant respectfully requests withdrawal of the rejection to independent claim 16.

The Examiner rejected claims 3, 5, 18 and 19 under 35 U.S.C. § 103(a) as being unpatentable over Wang in view of Sweeney et al. and Head and further in view of U.S. Patent No. 6,676,767 ("Chang"). The Examiner asserts that "Sweeney further comprises heating means (76, 23 and 54; comprising electrical resistance heaters, stream tracing lines, heating jackets or other known heating means, at least one of these being equivalent to the applicant's 'heating

means') extending about the body for maintaining the temperature within the body." The Examiner concedes that "Sweeney fails to provide a specific temperature that is desirable but does teach that the temperature is determined by the vapor pressure of the particulate forming in the gasses passing through the pipes, one of the gases commonly being BCl_3 (boron trichloride; Col. 1, lines 48-58)." However, the Examiner asserts that "Chang et al. discloses a similar apparatus for reducing clogging in pipes carrying gasses in fabricating processes, Chang also providing heating means to maintain the temperature within the body of the apparatus." In addition, the Examiner asserts that "Chang also discloses that boron trichloride may be a commonly used gas (Col. 1, lines 31-42) and further teaches that temperatures between 100-150° C are preferable to prevent reactions causing particulate deposition on the pipe walls." Chang further discloses, according to the Examiner, "that a specifically desirable temperature is typically around 105° C (Col. 2, lines 15-19)." The Examiner concludes that "it further would have been obvious...to provide the body of Wang with similar heating means that are capable of heating the gasses to be injected and for maintaining the temperature within the body within a range of 100-150° C, as taught by Chang, which falls within both of the ranges claimed in claims 3, 5, 18 and 19, thus anticipating the claimed ranges." Applicants respectfully traverse the rejection and seek favorable reconsideration in view of the follow remarks.

Applicants respectfully submit that, as discussed above with respect to independent claims 1 and 15, there is no teaching, suggestion or motivation to modify the apparatus of Wang by substituting the "driving device" with a hydraulic or pneumatic piston means, as taught by Head. Thus, Wang is not combinable with Head. In addition, assuming *arguendo*, even if Wang were combined with Head and Sweeney the combination would not achieve the invention as claimed in independent claim 1, from which claims 5 and 19 depend. The teachings of both Wang and Head are directed to removing deposits including cakes using a scrubber, but they fail to provide any teaching, suggestion or motivation to modify their devices to include an injecting means to inhibit particular deposition as claimed in independent claim 1. In addition, and more particularly, Sweeney teaches away from mechanical fixes, such as the scrubbers taught by Wang and Head, to prevent clogging of the gas flow passage 66. Accordingly, it would be improper to combine Wang with the teachings of Sweeney and Head. Moreover, assuming *arguendo*, even if Sweeney could be combined with Wang, the combination would not achieve the invention as claimed in claims 3, 5 and 18-19. Indeed, both Wang, Head and Sweeney fail to

teach or even suggest "injecting means *extending about the body* for injecting heated compressed gas into the body to inhibit particular deposition" (emphasis added) as claimed in independent claim 1 from which claims 5 and 19 depend. Thus, for at least these reasons, Applicants respectfully request withdrawal of the rejections to dependent claims 3, 5 and 18-19.

In addition, Applicants respectfully submit that, assuming *arguendo*, even if Chang were combined with Wang, Head and Sweeney, the combination would not achieve the invention as claimed in dependent claims 3, 5 and 18-19. Chang is directed to "an apparatus and method for removing metal chloride condensate...exhausted through the exhaust lines of a dry metal etching system in order to control the build-up of such condensate and prevent eventual clogging of vacuum pump lines..." Col. 1, Ln. 8-14. Chang describes "a typical aluminum etching process for producing components for semiconductor devices." Col. 1, Ln. 21-22. Chang explains that "[t]he exposed part of the aluminum film that is not protected by the photoresist is...removed by etching through the introduction of a low pressure...gas...such as...boron trichloride (BCl_3)." Col. 1, Ln. 31-35. Chang further explains that the etching reaction is typically plasma-enhanced where "[t]he generation of the plasma also causes the reaction chamber to heat up, typically to a temperature of 100 to 150°C." Col. 1, Ln. 35-42. Thus, Chang teaches that a plasma-enhanced etching reaction causes the process chamber to heat to 100 to 150°C, and contrary to the Examiner's assertion, Chang simply does not teach "that temperatures between 100-150°C are preferable to *prevent reactions causing particulate deposition* on the pipe wall." Office Action, p. 10. Nowhere does Chang teach or even suggest "injecting the gas at a temperature within the range from 50 to 200°C" as claimed in amended dependent claim 3. Chang also fails to teach or even suggest "heating means *extending about the body* for maintaining the temperature within the body within the range from 50 to 200°C" as claimed in dependent claim 5 or "...within the range from 80 to 150°C" as claimed in dependent claim 19. In addition, Chang also fails to teach or suggest "injecting the gas at a temperature within the range from 80 to 150°C" as claimed in amended dependent claim 18. Furthermore, the Examiner conceded that "Sweeney fails to provide a specific temperature that is desirable..." Office Action, p. 9. Accordingly, assuming *arguendo*, even if Wang could be combined with Head, Sweeney and Chang, the combination would not achieve the invention as claimed in dependent claims 3, 5 and 18-19.

Alternatively and without the teachings of Chang, the Examiner asserts that "Sweeney teaches that the temperature of the gas and interior of the body will directly effect the reactions

of the gasses and particulate matter therein within the pipes, thus teaching that the temperature of the gas and internal body temperature are both result-effective variables." The Examiner further asserts that "the applicant fails to provide any specific *evidence* of criticality for the claimed temperature ranges of 50-200°C or 80-150°C." The Examiner concludes that "in view of the disclosure of Sweeney, the claimed temperature ranges would have been obvious to one of ordinary skill in the art at the time the invention was made (see **MPEP** 2144.05, Section II)."

To overcome an obviousness rejection based upon optimization of ranges, one must show "that the particular range is critical" or "obviousness may also be rebutted by showing that the art...teaches away from the claimed invention." M.P.E.P. § 2144.05(III). As discussed above, Sweeney teaches away from the mechanical fixes of Wang, Head and Chang and from the invention as claimed in independent claim 1 from which claims 5 and 19 depend. For the same reasons, Sweeney teaches away from independent claim 16, from which claims 3 and 19 depend. In addition, even if Sweeney could be combined with Wang and Head, the combination would not achieve the invention as claimed in claims 3, 5 and 18-19. Notably, semiconductor tools are evacuated and thus, exhaust gas exits the tool under vacuum conditions. Sweeney teaches that "the exhaust gas *from the semiconductor tool* can be heated..." Col. 10, Ln. 33-40 (emphasis added). Sweeney fails to teach or even suggest "injecting means *extending about the body* for injecting heated *compressed gas* into the body..." (emphasis added) as claimed in independent claim 1 from which claims 5 and 19 depend. Moreover, Sweeney simply fails to teach "injecting the [compressed] gas at a temperature within the range from 50 to 200°C" as claimed in amended dependent claim 3; "heating means *extending about the body* for maintaining the temperature within the body within the range from 50 to 200°C" as claimed in dependent claim 5; "injecting the gas at a temperature within the range from 80 to 150°C" as claimed in amended dependent claim 18; and "heating means *extending about the body* for maintaining the temperature within the body within the range from 80 to 150°C" (emphasis added) as claimed in dependent claim 19. Thus, even if Wang were combined with Head, Sweeney and Chang, the combination would not achieve the invention as claimed in dependent claims 3, 5 and 18-19. Accordingly, Applicants respectfully submit that dependent claims 3, 5 and 18-19 are not rendered obvious by Wang either alone or in combination with Head, Sweeney or Chang. Thus, Applicants respectfully request withdrawal of the rejections to these claims.

Claims 12-14 were also rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang in view of Sweeney and Head (GB 2342372 A) and further in view of U.S. Patent No. 5,659,915 ("Dhingra et al."). The Examiner concedes that "Wang, Sweeney and Head all fail to disclose an annular seal through which the shaft passes, that acts as a means for preventing particulates from being drawn into the means for reciprocally moving and as a scraping means for scraping particulates from the shaft during movement." However, the Examiner asserts that "Dhingra discloses an apparatus for reducing clogging in pipes carrying gasses in fabricating processes, the apparatus having a scraper (19) mounted on a reciprocating shaft (22) and a means for moving the shaft (28) and Dhingra teaches that a scraping means (23) may be provided around the shaft, which also acts as a seal, to remove any particulate from the shaft during movement to prevent any particulate from passing into the moving means." The Examiner concludes that "it...would have been obvious...to provide an annular seal to the apparatus of Wang, Sweeney and Head for the shaft to pass through, which will act as a means for preventing particulates from being drawn into the means for reciprocally moving and as scraping means for scraping particulate from the shaft during movement, as taught by Dhingra, to prevent any particulate from passing into the moving means, which may cause damage, and to prevent build up of particulate matter on the shaft."

Applicants have canceled dependent claim 12 and thus, the rejection to this claim has been obviated. Applicants respectfully submit that, as discussed above with respect to independent claims 1 and 15, there is no teaching, suggestion or motivation to modify the apparatus of Wang by substituting the "driving device" with a hydraulic or pneumatic piston means, as taught by Head. Thus, Wang is not combinable with Head. In addition, assuming *arguendo*, even if Wang were combined with Head, Sweeney and Dhingra, the combination would not achieve the invention as claimed in independent claim 1, from which claims 13-14 depend. The teachings of both Wang and Head are directed to removing deposits including cakes using a scrubber, but they fail to provide any teaching, suggestion or motivation to modify their devices to include an injecting means to inhibit particulate deposition as claimed in independent claim 1. In addition, and more particularly, Sweeney teaches away from mechanical fixes, such as the scrubbers taught by Wang, Head and Dhingra, to prevent clogging of the gas flow passage 66. Accordingly, it would be improper to combine Wang with the teachings of Sweeney, Head and Dhingra. Moreover, assuming *arguendo*, even if Sweeney could be

combined with Wang, Head and Dhingra, the combination would not achieve the invention as claimed in independent claim 1 from which claims 13-14 depend. Indeed, Wang, Head, Sweeney and Dhingra fail to teach or even suggest "injecting means *extending about the body* for injecting heated compressed gas into the body to inhibit particulate deposition" (emphasis added) as claimed in independent claim 1 from which claims 13-14 depend. Thus, for at least these reasons, Applicants respectfully request withdrawal of the rejections to dependent claims 13-14.

Applicants respectfully submit that, in view of the foregoing remarks, claims 1-11, 13-16 and 18-19 are not rendered obvious by Wang, either alone or in combination with Head, Sweeney, Chang or Dhingra. In addition, amended dependent claims 3-4 and 18 are in proper dependent form under 37 CFR 1.75(c) and dependent claim 10, as filed, is enabled and meets the written description requirement under 35 USC § 112, ¶¶ 1-2. Moreover, the objection to claims 13-14 has also been overcome. Accordingly, Applicants respectfully submit that claims 1-11, 13-16 and 18-19 are in condition for allowance and request that these claims be promptly passed to issue.

The Office Action contains numerous statements reflecting characterizations about the invention(s), the claims, and the related art with which Applicant does not necessarily agree. Regardless of whether any such statement or characterization is discussed above, Applicants declines to subscribe to any statement or characterization in the Office Action.

Applicant has enclosed a request for a three-month extension of time. Applicant does not believe that any additional fee is due, but as a precaution, the Commissioner is hereby authorized to charge any additional fee to deposit account number 50-4244.

Respectfully Submitted,

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